EL-USB-2+

High Accuracy Temperature, Humidity and Dew Point Data Logger

- -35 to +80°C (-31 to +176°F) and 0 to 100%RH measurement range
- Stores over 16,000 readings for both temperature and humidity
- EasyLog software available as a free download
- Logging rates between 10 seconds and 12 hours
- Immediate and delayed logging start
- User-programmable alarm thresholds for both temperature and humidit
- Status indication via red/green LEDs
- Environmental protection to IP67



This standalone data logger measures and stores over 16,000 temperature and humidity readings from -35 to +80°C (-31 to +176°F) and 0 to 100%RH range at a resolution of 0.5°C (1°F) and 0.5%RH.

The user can easily set up the logger and view downloaded data by plugging the data logger into a PC's USB port and using the free EasyLog software. Data, including calculated dew point, can then be graphed, printed and exported to other applications for detailed analysis.

The data logger is supplied with a lithium metal battery, giving up to three years' logging life. The logger is protected against ingress from water and dust to IP67 standard when the cap is fitted.

SPECIFICATIONS

Temperature	**Measurement range**	-35°C to 80°C (-31°F to 176°F)
	Internal resolution	0.5°C (1°F)
	Accuracy (overall error)*	0.45°C (0.86°F) typical (5 to 60°C)
	Long term stability	<0.02°C (0.04°F) / year
Relative Humidity	**Measurement range**	0 to 100%RH
	Internal resolution	0.5%RH
	Accuracy (overall error)*	2.0%RH typical (10 to 90%RH)
	Long term stability	<0.25%RH / year
Dew Point	**Accuracy (overall error)***	1.5°C typical (-35 to 80°C, 40 to 100%RH)
Logging rate		User selectable between 10 seconds & 12 hours
Operating temperature range		-35 to +80°C (-31 to +176°F)
Battery life		3 years (at 25°C and 1 minute logging rate)
Readings		16,382 temperature, 16,382 relative humidity
Dimensions		108 x 25 x 22mm (4.25 x 0.98 x 0.86")

* The overall error takes in to account the sensor accuracy (as shown on page 3) and the resolution of the data logger

ACCESSORIES

BAT 3V6 1/2AA	Replacement battery
EL-DataPad	Handheld data logger programmer & collector

INCLUDED IN THE BOX

BAT 3V6 1/2AA	Battery
EL-USB Wall Bracket	Mounting Bracket

CALIBRATION CERTIFICATES NOW AVAILABLE

Lascar now offers a Traceable Calibration Certificate Service on Temperature Data Loggers. Using reference equipment which has been calibrated by a UKAS/NIST accredited laboratory and using apparatus traceable to national or international standards. For more information, please see **www.lascarelectronics.com**.

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EASYLOG SOFTWARE

Lascar's EasyLog control software is available as a free download from www.easylogusb.com. Easy to install and use, the control software is compatible with 32-bit and 64-bit versions of Windows 7, 8 & 10. The software is used to set up the logger, download, graph and annotate data or export in Excel, PDF and jpeg formats.



The software allows the following parameters to be configured:

- Logger name
- Measurement parameter (°C or °F)
- Logging rate (user selectable between 10 seconds and 12 hours)
- High and low alarms
- Immediate and delayed logging start

Download the latest version of the software free of charge from www.easylogusb.com

LED STATUS INDICATION

The EL-USB-2 features two green/red LEDs, one to represent temperature measurement and the other to represent humidity measurement. Each is clearly marked on the logger. To save power, the status indication alternates between the two channels every 10 seconds. First you will see the status of the temperature channel and 10 seconds later you will see the status of the RH channel and so on.

RH%	°C (°F)	10 seconds later	RH%	°C (°F)

In normal operation the green LED will flash, but will change to red if an alarm condition has been triggered. Using EasyLog software it is possible to set the alarm to remain active even if the reading has returned to normal, in which case the alarm LED will continue to flash red. This 'Hold' feature in the software ensures the user is notified that at some point an alarm level has been exceeded, without needing to download the data.

	Green double flash The data logger is not currently logging, but is primed to start at a later date and time (delayed start)
	Green single flash The data logger is currently logging. No alarm on the channel
	Red single flash The data logger is currently logging. Low alarm on the channel
	Red double flash The data logger is currently logging. High alarm on the channel
	Green triple flash The data logger is full and has stopped logging. No alarm on the channel
	Red triple flash The data logger is full and has stopped logging. Alarm (high, low or both) on the channel
	No LEDs flash The data logger is stopped, the battery is empty or there is no battery
	Dual Red flash (every 60 seconds) The data logger battery is running low as it's voltage has dropped below 2.9V

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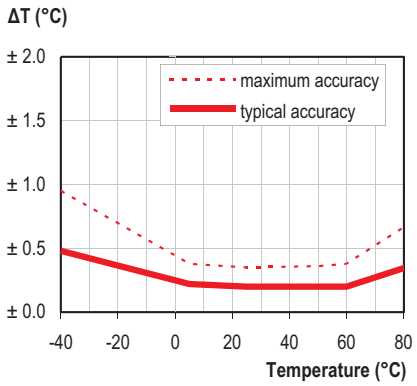
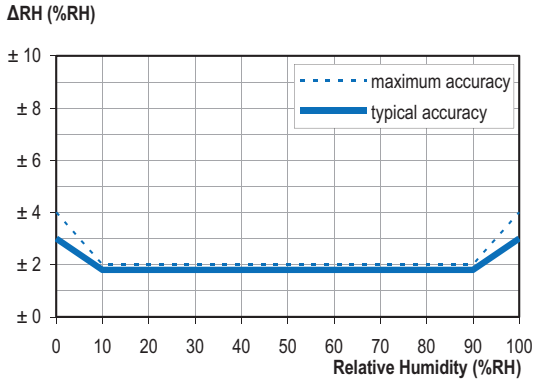
SENSOR ACCURACY & INFORMATION

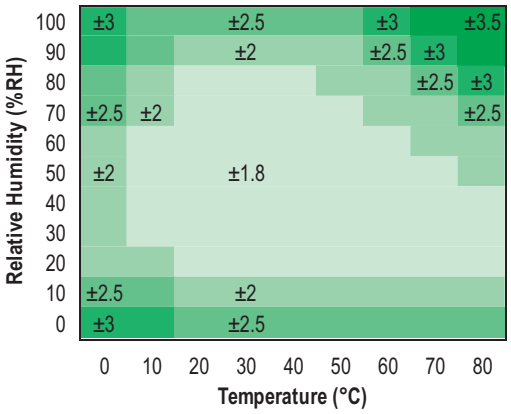
Typical and maximal tolerance for temperature sensor in °C.



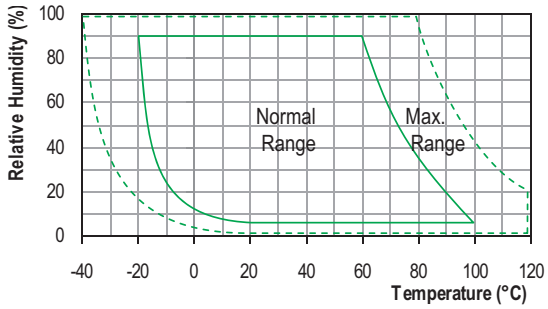
Typical and maximal tolerance at 25°C for relative humidity.



Typical accuracy of relative humidity measurements given in %RH for temperatures 0 to 80°C.



Operating conditions



Long term exposure to humidity levels outside of the 'normal' range may temporarily offset RH measurements (±3%RH after 60 hours). Once returned to less extreme conditions the device will slowly return towards calibration state.

When tracking changes in ambient conditions, the response time of the humidity sensor in your data logger is approximately 20 minutes to reach 90% of the reading. However, if you are measuring step changes in humidity (for example if calibrating the product) it is advised that you leave the unit for up to four hours to ensure that it has enough time to settle at the new level.

It is worth remembering that the value of relative humidity is of course sensitive to temperature variation. As an example, at a relative humidity of ~90%RH at ambient temperature, a variation in temperature of 1°C will result in a change of up to -5%RH. Therefore when comparing multiple devices or calibrating them, any temperature variations must be considered.

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The humidity measuring element in the humidity data loggers can be contaminated through exposure to a variety of compounds. These products should not be kept in proximity to volatile chemicals such as solvents and other organic compounds. Generally speaking, if a material or compound emits a strong odour you should not keep your humidity data logger in close proximity to it. If you would like more information, please contact your local Lascar Electronics office.

Exposure to extreme conditions or chemical vapours will require the following reconditioning procedure to bring the internal sensor back to calibration state:

Baking	80°C (176°F) at < 5%RH for 36 hours.
Re-hydration	20 to 30°C (70 to 90°F) at > 74%RH for 48 hours.

High levels of pollutants may cause permanent damage to the internal sensor.

BATTERY INFORMATION

Replacement
We recommend that you replace the battery annually, or prior to logging critical data. Only use 3.6V ½AA lithium metal batteries. The data logger does not lose its stored readings when the battery is discharged or replaced; however, the data logging process will stop and will not resume until the battery is replaced and the logger restarted by EasyLog software or an EL-DataPad.

Before replacing the battery, remove the data logger from the PC. Please note that leaving the data logger plugged into the USB port for extended periods will cause some of the battery capacity to be lost.

Passivation
If left unused for extended periods of time the lithium metal batteries, including those used in the EasyLog range of data loggers, naturally form a non-conductive internal layer preventing them from self-discharge and effectively increasing their shelf life. When first installed in the data logger, this may cause a momentary drop in the battery voltage (the Transient Minimum Voltage) as the internal layer is broken down, resulting in the data logger resetting. Inserting the batteries in the data logger and leaving it connected to a PC for about 30 seconds will remove this layer. After this, remove and re-install the batteries to reset the data logger. Overall battery life will not be affected.

WARNING

Handle lithium metal batteries carefully, observe warnings on battery casing. Dispose of in accordance with local regulations.